Growth and plumage changes of the Grey Crowned Crane *Balearica regulorum gibbericeps*

by D. E. Pomeroy

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In his review of the African crowned cranes, *Balearica,* Walkinshaw (1964) recognised 2 species *B. pavonina* and *B. regulorum. B. r. gibbericeps* is the form found in Tanzania and throughout Uganda and Kenya except for the far north and, according to Mackworth-Praed & Grant (1952) also in Zambia, Malawi and Angola. Subsequently Snow (1978) placed all African crowned cranes in *pavonina;* but Brown *et al.* (in press), on the basis of both field observation and skins, retain both species. For simplicity, I have employed the term Crowned Crane, unless otherwise specified, to mean *G. r. gibbericeps.*

Between 1970 and 1973 I obtained 7 Crowned Cranes of various ages in southern Uganda. Three young birds were reared in captivity for periods of

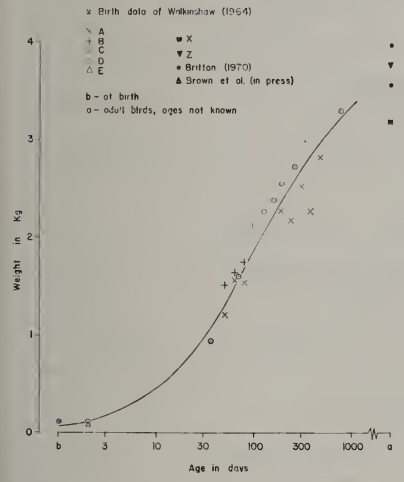

Fig. 1.

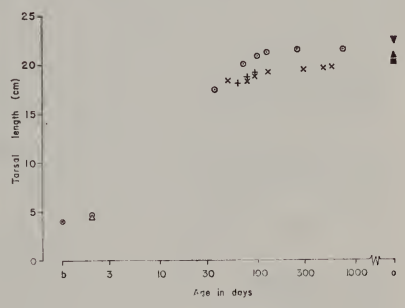

Fig. 2.

Fig. 1. Weights of 5 young and 4 adult Crowned Cranes *Balearica regulorum.* Britton's (1970) 2 birds were from Kenya. The curve was fitted by eye. Note that age is represented on a logarithmic scale.

Notes:

A = young c. 7 weeks old when obtained.
B = same as A.
C = young c. 4 weeks old when obtained.
D, E = young c. 2 days old, both dying 2 days later.
X, Z and Britton's (1970) birds were adults.

(*above, right*)

Fig. 2. Tarsal lengths of 5 young and 2 adult Crowned Cranes *Balearica regulorum,* together with published data. Symbols as for Fig. 1.

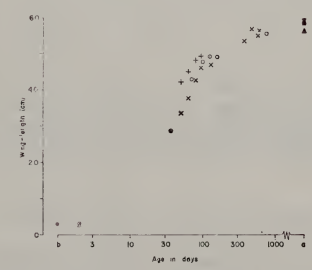

Fig. 3. Wing-lengths of 5 young Crowned Cranes *Balearica regulorum* and a number of adult Crowned Cranes. Symbols as for Fig. 1.

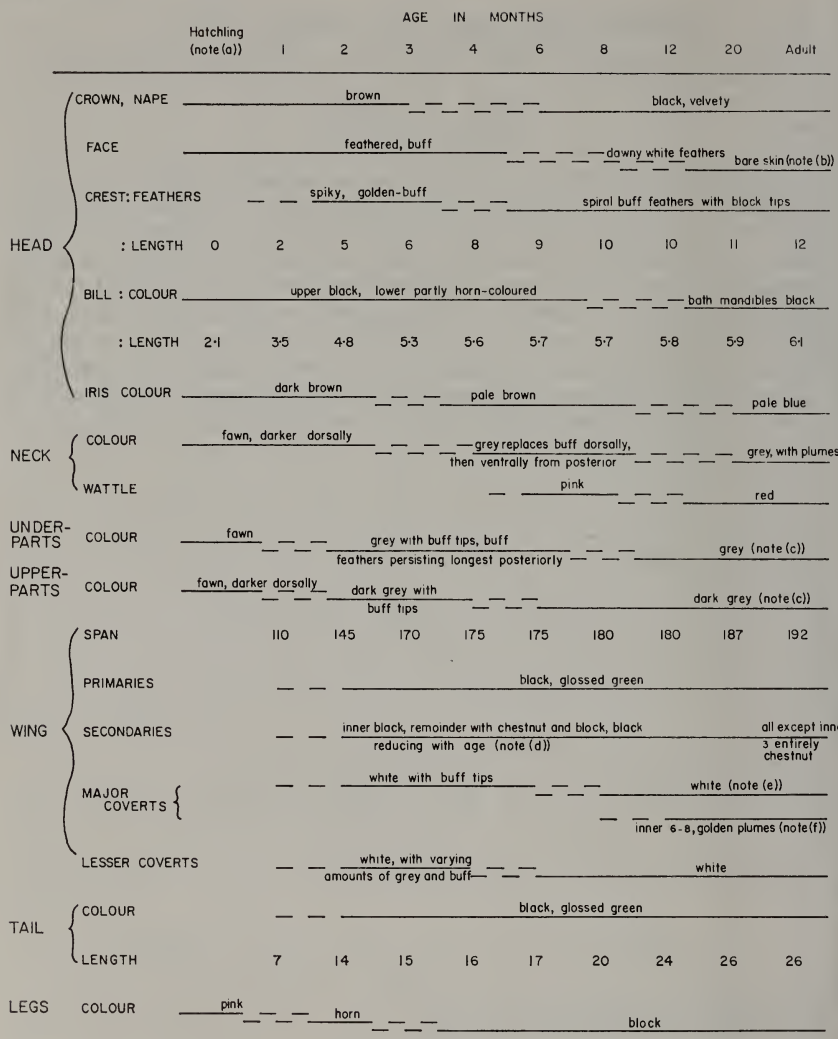

TABLE I

Changes with age (in months) in the appearance of young Crowned Cranes *Balearica regulorum* (see Fig. 1). Measurements are in cm. There was some individual variation and the data are only approximate with respect to age. Details of moult were not recorded.

Notes

(a) Walkinshaw (1964) gives a detailed description of the South African Crowned Crane *B. r. regulorum* at hatching.

(b) In the adult, there are bright red patches above and below the white face. Mackworth-Praed & Grant (1952) and Walkinshaw (1964) mention only the upper patch. The red patches are preceeded by pink, noticeably paler in the field at 12 months, and in captives up to 18–20 months.

(c) Mackworth-Praed & Grant (1952) describe the "general colour" as black, but this is not so, although posteriorly the grey is darker.

(d) In the adult, the outermost one or two secondaries resemble primaries in appearance, the next two or three have inner webs black, and the exposed parts of the remainder are all chestnut, but with black bases. The innermost two or three secondaries are plume-like.
(e) In the adult, all under-wing coverts are completely white.
(f) This increases to about 15 in the adult, the proximal parts being white with a normal vane.
(g) Brown *et al.* (in press) give mean tail-lengths of 24 cm and bill-lengths of 6.3 cm for adults of various races.

up to 23 months (Figs. 1–3). Their ages when first obtained were judged from the opinions of several Ugandans who were familiar with young Crowned Cranes in the wild; their independent estimates were averaged, but in any case were in close agreement. The birds were kept in a large aviary and fed mainly on groundnuts, supplemented with a variety of other foods, especially insects, of which they were particularly fond (Clarke & Amedei 1969; Pomeroy 1980). No attempt was made to tame them.

Growth of young birds

Typically, weight increase follows a sigmoid curve. Ricklefs (1973) gives several methods of determining a growth-constant K_G which relates weight to time, and is a characteristic of the particular species. When a curve was fitted by eye to the data of Fig. 1, and weights at various ages estimated from it, the rate of growth was found to decrease with age, namely at 10–30 days $K_G = 0.0440$, at 30–100 days $K_G = 0.0133$, at 100–300 days $K_G = 0.0047$ and at 300–1000 days $K_G = 0.0014$. Taking values from the curve, the weight of the young at 100 days (Fig. 1) was only half the average weight of the 4 adults; whereas tarsal length (Fig. 2) was about 95% and wing-length (Fig. 3) 85% of the adult values. Relatively faster tarsal growth is to be expected in a nidifugous species living in long grass, and indeed the young are noticeably "long-legged". The wing-length is only slightly higher than would be expected from the weight on a basis of proportionality $0.85^3 = 0.61$). Growth of bill, tail, wing-span and crest were also slow (Table 1), only approaching adult dimensions at an age of 12–20 months.

Judging from their locomotory behaviour, the young captives were probably capable of flight by an age of about 100 days. This agrees with Walkinshaw's (1964) observations on wild *B. r. regulorum*. In Uganda, there were several occasions when I saw flying young that were noticeably smaller than their parents.

The appearance of the young changes progressively with age (Table 1). In the field, they are distinguishable from adults up to 12 months old (Table 2.b), when the adult face patterning is apparent though not fully-developed. The adult eye-colour and the full red of upper and lower face-patches and neck wattle are not attained until 20–24 months, but only exceptional views enable these characters to be distinguished in the field.

Changes in plumage result, of course, from growth, wear and moult of feathers. Moult sequences of young *Balearica* were not reported by Stresemann & Stresemann (1966) and they are apparently unknown. The young bird retains its cryptic appearance until nearly 2 months old, when the white wing coverts first appear, but these are relatively inconspicuous until after the young can fly. The flight feathers of the immature resemble those of the

adult by the age of 3 months, but the decorative golden plumes of the inner secondary coverts, and the grey ones of the neck, only begin to appear at around 12 months, whilst even at 20 months the face and iris lack the full colours of the adult.

Discussion

The growth-rate of young *B. r. regulorum* is slow, despite an initial rate comparable to that of other nidifugous birds of similar size (Ricklefs 1973); they take about 2 years to reach full adult size. The Sandhill Crane *Grus canadensis* of North America maintains its initial growth-rate, so that by an age of 4–5 months its weight is 91% that of adults (Miller & Hatfield 1974), whereas Crowned Cranes of that age had attained less than 60% of the adult weight. This difference may be attributed to the greater need of the Sandhill Crane for rapid growth, since unlike the Crowned Crane it is migratory.

The fact that crowned cranes also take about 2 years to achieve adult plumage is not surprising for a large species which is probably at least 3 years old when it first breeds (Sandhill Cranes are thought not to breed before the age of 4—Miller 1973). However, whereas most species have one or more distinctive juvenile plumages, usually separated by moults, the development of the adult plumage in Crowned Cranes is a continuous process, but lacking synchrony between the different parts of the body.

The use of plumage details in distinguishing different races of *B. regulorum* needs further investigation. Walkinshaw (1964: 361) doubted whether *gibbericeps* should be separated from *regulorum,* but Crowned Cranes are non-migratory and some geographic variability is to be expected. An example of minor geographic variation is the occurrence of red patches between the white of the face. The lower red patch was observed on all birds in Uganda which were examined closely, but is not reported for Crowned Cranes in Kenya, although a bird which I observed in 1972 at Lake Naivasha, in south central Kenya, had a pink patch below the white, which suggests that it was either an intermediate form, or an immature of the Ugandan type (see Table 1).

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On the Wedge-tailed Green Pigeon *Treron sphenura etorques* of Sumatra

by Carlo Violani

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Historical notes

In 1879, describing the birds of Sumatra, Tommaso Salvadori examined 3 male specimens of a Wedge-tailed Green Pigeon "*Sphenocercus korthalsii* (S. Müll.)?" which had been obtained and sexed by the Italian explorer Odoardo Beccari on Mount Singgalan (0° 24′ S. 100° 20′ E), West Sumatra, during the previous year. Salvadori noticed that all 3 birds were lacking the rufous-orange breast band of ♂ *korthalsi* of Java; therefore, relying on Beccari's signed indication of sex on their labels, he proposed the name of *Sphenocercus etorques* for this "different species, perhaps a new one" (Salvadori 1879: 244). He also remarked that Sumatra was wrongly claimed as a type locality for *korthalsi* by both C. L. Bonaparte (in addition to "Malasia") and G. R. Gray, the latter being probably misled by 2 orange-breasted male specimens in the British Museum (Nat. Hist.) (BMNH), erroneously labelled "Sumatra" and received from Leyden Museum (see Discussion).

By 1893, however, Salvadori had changed his mind, as, in *Cat. Birds Brit. Mus.* 21: 11, under the species "*Sphenocercus korthalsii*", he wrote: "The specimens in Beccari's collection from Mt. Singalane, W. Sumatra (*S. etorques* Salvad.), were most probably not fully adult birds. Hab. Java and Sumatra."

Since then, as far as I know, the matter has never been raised again: *Sph. etorques* Salvad. is listed as a synonym of *korthalsi* Bp. by Robinson & Kloss (1918: 103-104), by Chasen (1935: 11) and is completely ignored in Peters' Volume 3 (1937). However, after examination of the available museum skin material, I believe it justified to re-propose the name *Treron sphenura etorques* (Salvadori) for the Sumatran taxon. (Reasons for merging the genus *Sphenurus* Swainson 1837=*Sphenocercus* G. R. Gray 1840 into *Treron,* given by Husain, are summarized by Goodwin (1970: 297).)

Soon after their description, the Salvadori syntypes—3 fully adult ♂♂ indeed—found their way into the richest Italian bird collections of the time. Two of them, Beccari's Nos. 24 and 113, went to Genoa Museum of Natural History, where they are still preserved as skins today. The first bears the following (translated) notes written by Beccari from the freshly killed bird, on the back of its label: "Iris bright blue; base of bill, same [colour]; feet coral. Eats *Melastoma* fruit.".

The third specimen, Beccari's No. 10, was acquired by Count Ercole Turati of Milan, whose splendid ornithological collection was bequeathed,